

SYNONYMIZING *SPILODERMUS* STÅL UNDER *PEIRATES* SERVILLE, AND
REVISION OF THE RESULTING *P. QUADRINOTATUS* SPECIES GROUP
(HETEROPTERA: REDUVIIDAE: PEIRATINAE)

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Abstract.—*Spilodermus* Stål is synonymized with *Peirates* Serville. Its species *P. argenteopilosus* Schouteden and *P. quadrinotatus* (Fabricius) (*Pirates arcuatus* Stål, **new synonymy**) are assigned to the new *P. quadrinotatus* species group. These two species are redescribed, illustrated, their geographical distribution mapped, and a key for separating them is given. These species have an African-Indopacific distribution.

Key Words: Heteroptera, Reduviidae, *Peirates quadrinotatus* species group, *Peirates argenteopilosus*, *Peirates quadrinotatus*

Spilodermus Stål (1868) was originally described as a subgenus of *Peirates* Serville (1831) and contained the sole species *Reduvius quadrinotatus* Fabricius. This status was accepted by Dispons (1969), but valid generic standing was given by Villiers (1963) and Maldonado Capriles (1990).

The present synonymizing of *Spilodermus* as a junior synonym of *Peirates* transfers its three species to that genus where they form the new *quadrinotatus* species group, containing one new synonymy: *Peirates argenteopilosus* Schouteden, *Peirates quadrinotatus* (Fabricius) (= *Pirates arcuatus* Stål).

MATERIAL AND METHODS

The material examined belongs to the following institutions: American Museum of Natural History (AMNH), New York, USA; Bishop Museum (BPBM), Honolulu, USA; Deutsches Entomologisches Institut (DEI), Eberswalde, Germany; Instituut voor Taxonomische Zoölogie, Zoölogisch Museum, Universiteit van Amsterdam (ZMUA), Amsterdam, The Netherlands; Musée Royal

de l'Afrique Centrale (MRAC), Tervuren, Belgium; Naturhistoriska Riksmuseet (NRS), Stockholm, Sweden; The Natural History Museum (BMNH), London, United Kingdom; Zoological Institute (ZIL), Saint Petersburg, Russia; and Zoological Museum (MZH), University of Helsinki, Helsinki, Finland.

The terminology used for the external morphology has been reported previously (Coscarón 1983, Lent and Jurberg 1966, Lent and Wygodzinsky 1979). The measurements and ratios, as seen in Table 1, were taken following Coscarón (1989). For this revision a total of four measurements and 11 ratios were selected. The terminology of the female genitalia has been detailed in Coscarón (1994). Extraction, dissection, inflation, and drawings of the male and female genitalia were performed according to Coscarón (1983).

GENUS *PEIRATES* SERVILLE

Peirates Serville 1831: 215. Type species: *Reduvius stridulus* Fabricius, designated by Blanchard 1846: 106.

1963: 513; Maldonado Capriles 1990: 374.

Male and female General aspect of female as seen Fig. 1. Head black, granulated, black pilosity. In lateral view (Fig. 2), eyes surpassing neither superior nor inferior edge of head. Antenna uniformly dark brown.

Pronotum anterior lobe reddish with dark brown tonalities, granulate. Sulci not distinct glabrous. Depression not distinct. Sutures undifferentiated. Posterior lobe reddish, with dark brown tonalities, with granulations and dark brown hairs. Scutellum, uniformly reddish, with dark brown hairs.

Predominating color dark brown, except for whitish stripe between Pcu+ 1A and Cu in corium, and two whitish bands in membrane, one basally and other distally. Pilosity white basally in clavus and corium.

Legs mostly dark brown, coxae distally, all hind, and base of mid and hind trochanter, base of femora yellowish; hind femur dark brown basally.

Pattern of connexivum as seen in Fig. 5. Urosternites 4–6 with a lateral whitish triangular pilose area.

Male genitalia (Figs. 6–9). Medial process of pygophore, ventral and lateral view as seen in Figs. 6 and 7, respectively. Parameres (Figs. 8, 9) with hairs.

Female genitalia (Figs. 10–12). Gonocoxites VIII and gonapophysis, gonocoxite IX, and IX and X tergites as seen in Figs. 10, 11 and 12, respectively. IX and X tergites (Fig. 12), intersegmental line not entire.

Measurements. See Table 1.

Distribution. Afrotropical. Angola, Cameroon, Guinea, Tanzania and Zaire (Fig. 25).

Material examined. Holotype ♀: Zaire, Uele, van Kerckhoveville Degreef R. Det. A. 2450 (MRAC); Paratype ♂: Angola, Benguela (Ddr. Wellmann), Coll. Schouteden, Det. A. 2450 (MRAC); Paratype ♂: Kenya, Lac. Tanganyika, Nyanza fin, XII-1932, L. Burgeon (MRAC); Paratype ♂:

Zaire, Lulua, Kapanga, IV-IX-1958, J. Al-laer (MRAC); Paratype ♂: Zaire, Uele, Dingila, 20-VII-1933, J. V. Leroy (MRAC); Paratype ♂: Zaire, Haut-Uele, Moto II-III-1923, L. Burgeon R. Det. A. 2450 (MRAC); Paratype ♂: Zaire, Haut-Uele, Moto IV-1926, L. Burgeon R. Det. B. 2450 (MRAC); Paratype ♂: Zaire, Haut-Uele, Moto IV-V-1923, L. Burgeon R. Det. A. 2450 (MRAC); Paratype ♂: Zaire, Haut-Uele, Moto L. Burgeon R. Det. A. 2450 (MRAC); Paratype ♂: Kasai Ishiluagi, 14-II-1932, G. F. Overlaet, R. Det. C. 2450 (MRAC); Paratype ♂: Kindu, 24-XI-1911, Dr. Bequaert, R. Det. A. 2450 (MRAC); Paratype ♂: Beni à Lesse fin, VII-1911, Dr. Murtula, R. Det. A. 2450 (MRAC); Paratype ♂: Sankisia, 1911, Dr. Rodhain, R. Det. A. 2450 (MRAC); Paratype ♂: Kwamouth, VI-1921, Dr. H. Schouteden, R. Det. A. 2450 (MRAC); Paratype ♂: Rutshuru, II-1938, J. Ghesquière 6041 (MRAC); TANZANIA: Moba, 780 m (à la lumière), XI-1953, H. Bomans, ♂ (MRAC); Musoma, 980 m (à la lumière), XI-1953, H. Bomans, ♂ (MRAC); Moba, III-IX-1953, H. Bomans, ♂ (MRAC). ZAIRE: P. N. G. Miss. H. de Saeger, 11/Fb/9, 5-III-1951, Réc. H. de Saeger. 1320, ♀ (MRAC); P. N. U., Georges de la Pelenge, 18-20-VI-1947, Miss. G. F. de Witte. 526a, ♀ (MRAC); P. N. G. Miss. H. de Saeger Mpaza/9, 23/I/1952, Réc. H. de Saeger. 3038, ♂ (MRAC); Lulua, Tshibamba, III-1933, F. G. Overlaet, ♀ (MRAC). Abessinia: Sekuala lac. Suai Fl. Dzallumaki, Manash, Sedov, ♂ 3-II-V-1903 (ZIL).

Peirates quadrinotatus (Fabricius)
(Figs. 13–24)

Reduvius 4-notatus Fabricius 1796: 544.

Peirates biguttatus Dohrn 1860: 407; synonymized by Stål 1868: 122.

Spilodermus quadrinotatus: Stål 1868: 122; Maldonado Capriles 1990: 374.

Pirates quadrinotatus: Walker 1873: 114.

Pirates (Spilodermus) quadrinotatus: Stål 1874: 58.

Pirates patricius Miller 1948: 444; synon-

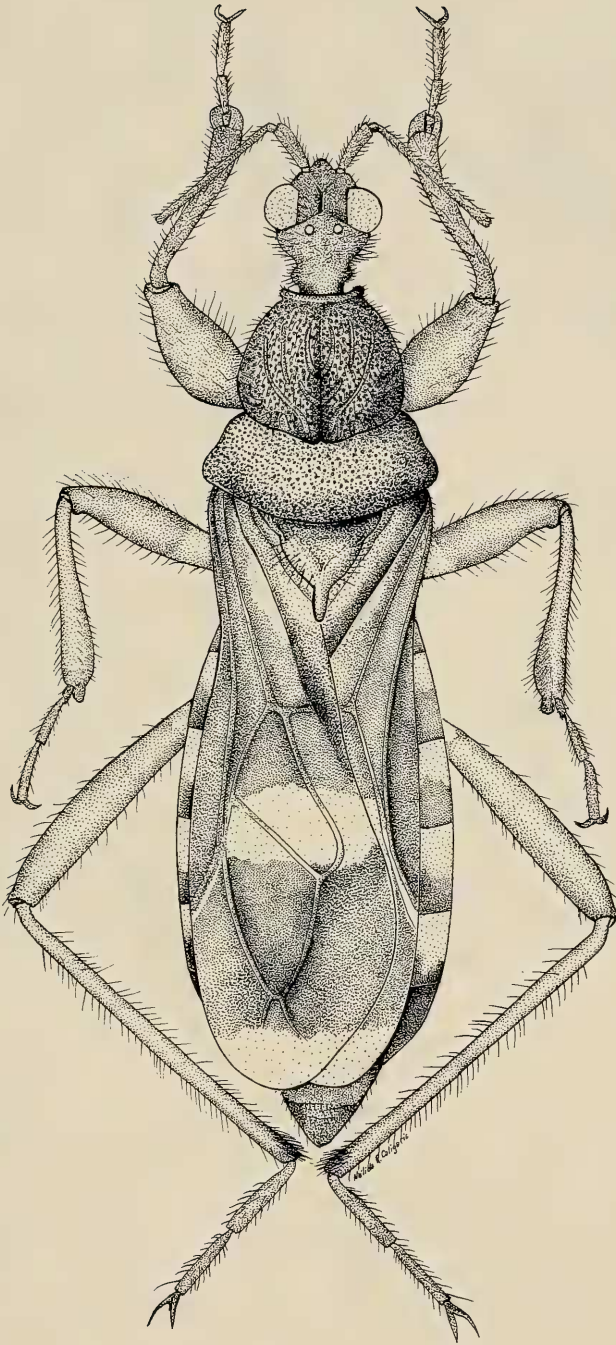
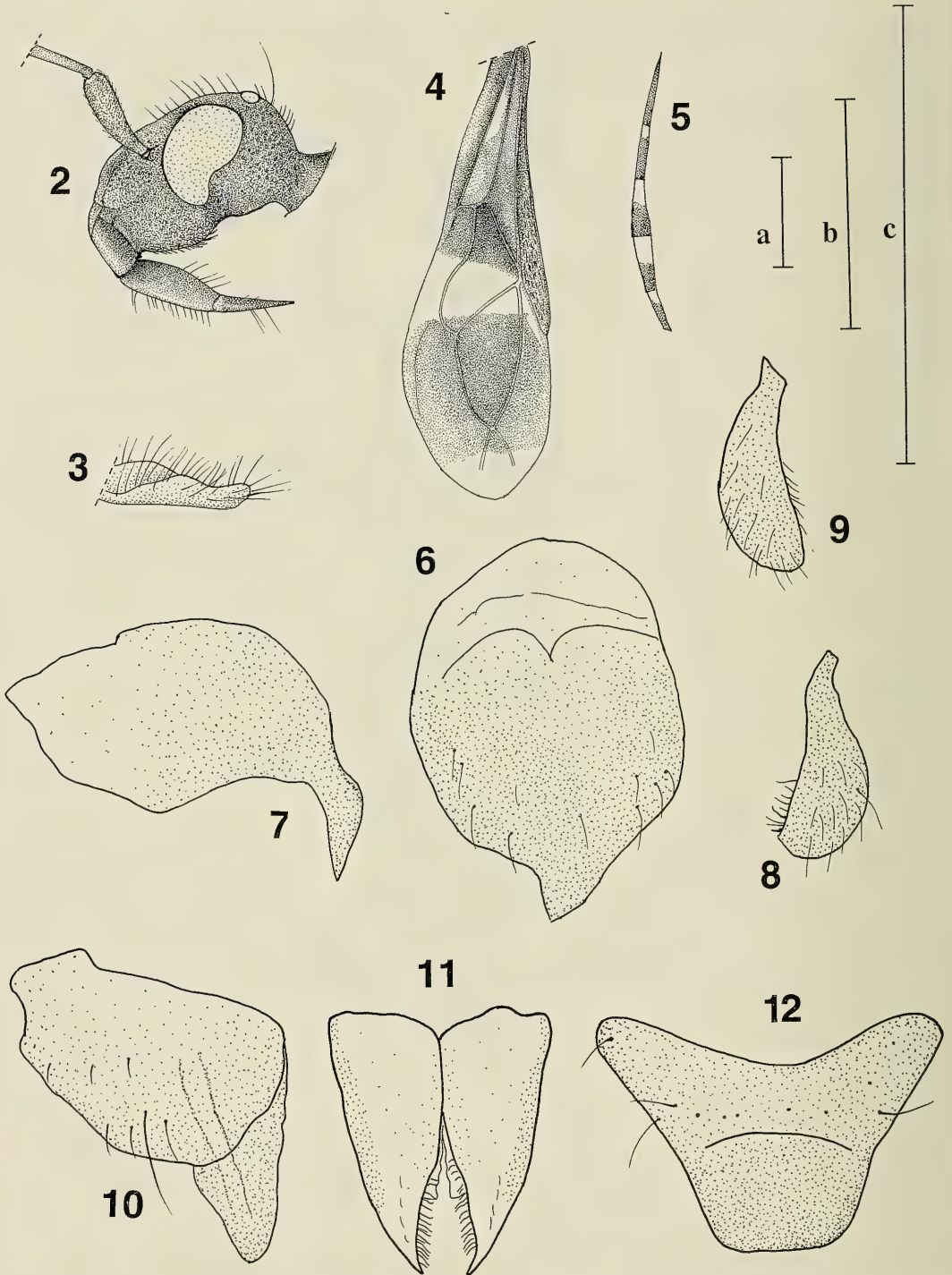


Fig. 1. *Peirates argenteopilosus*, dorsal view of female. Scale line = 2.0 mm.



Figs. 2-12. *Pierates argenteopilosus*. 2, Head, lateral view. 3, Scutellum, lateral view. 4, Hemelytron. 5, Connexivum. 6, Pygophore, ventral view. 7, Pygophore, lateral view. 8, Left paramere, external view. 9, Right paramere, external view. 10, Gonocoxite and gonapophysis VIII. 11, Gonocoxites IX. 12, IX and X tergites. Scale lines = 2.0 mm: (a) for Figs. 4, 5; (b) for Figs. 2, 3; and (c) for Figs. 6-12.

ymized by Dispons 1969: 7 with *Pirates (Spilodermus) arcuatus*.

Peirates patricius: Maldonado Capriles 1990: 365.

Pirates picturatus Miller 1948: 444; synonymized by Dispons 1969: 7 with *Pirates (Spilodermus) arcuatus*.

Peirates picturatus: Maldonado Capriles 1990: 365.

Pirates arcuatus Stål 1870: 692. **New synonymy.**

Pirates (Spilodermus) arcuatus: Stål 1874: 58; synonymized by Kiritshenko 1961: 444 with *Éctomocoris flavomaculatus*.

Pirates mutilloides sic Walker 1873: 120; synonymized by Distant 1902: 288 with *P. arcuatus*.

Male and *female*. Head dark brown, almost black, not granulated, whitish pilosity. In lateral view (Fig. 14), eyes surpassing superior but not inferior edge of head. Antenna uniformly dark brown, except base first antennal segment yellowish.

Pronotum anterior lobe brownish with dark brown tonalities, not granulate. Sulci distinct, with whitish to light brown pilosity, and light brown hairs. Depression distinct. Lateral internal sulci medially united and extending to transversal sulci, medial sulci divided in two and attaining transversal sulci, and lateral external sulci attaining transversal sulci. Posterior lobe brownish, with dark brown tonalities, without granulations and light brown hairs. Scutellum not uniformly brownish, with dark brown tonalities, and light brown hairs.

Predominating color dark brown in membrane and part of corium, except a whitish stripe and a spot in membrane. Clavus brown, except basal zone with orange tonalities. Corium, area between Pcu+ 1A and Cu brown, and Cu and SC brown with orange tonalities (in some specimens more noticeably). Pilosity at base of clavus and corium dark brown.

Legs dark brown, except yellowish distal end of coxae, base of mid and hind trochanter, base of mid and hind femur.

Pattern of connexivum as seen in Figure 17.

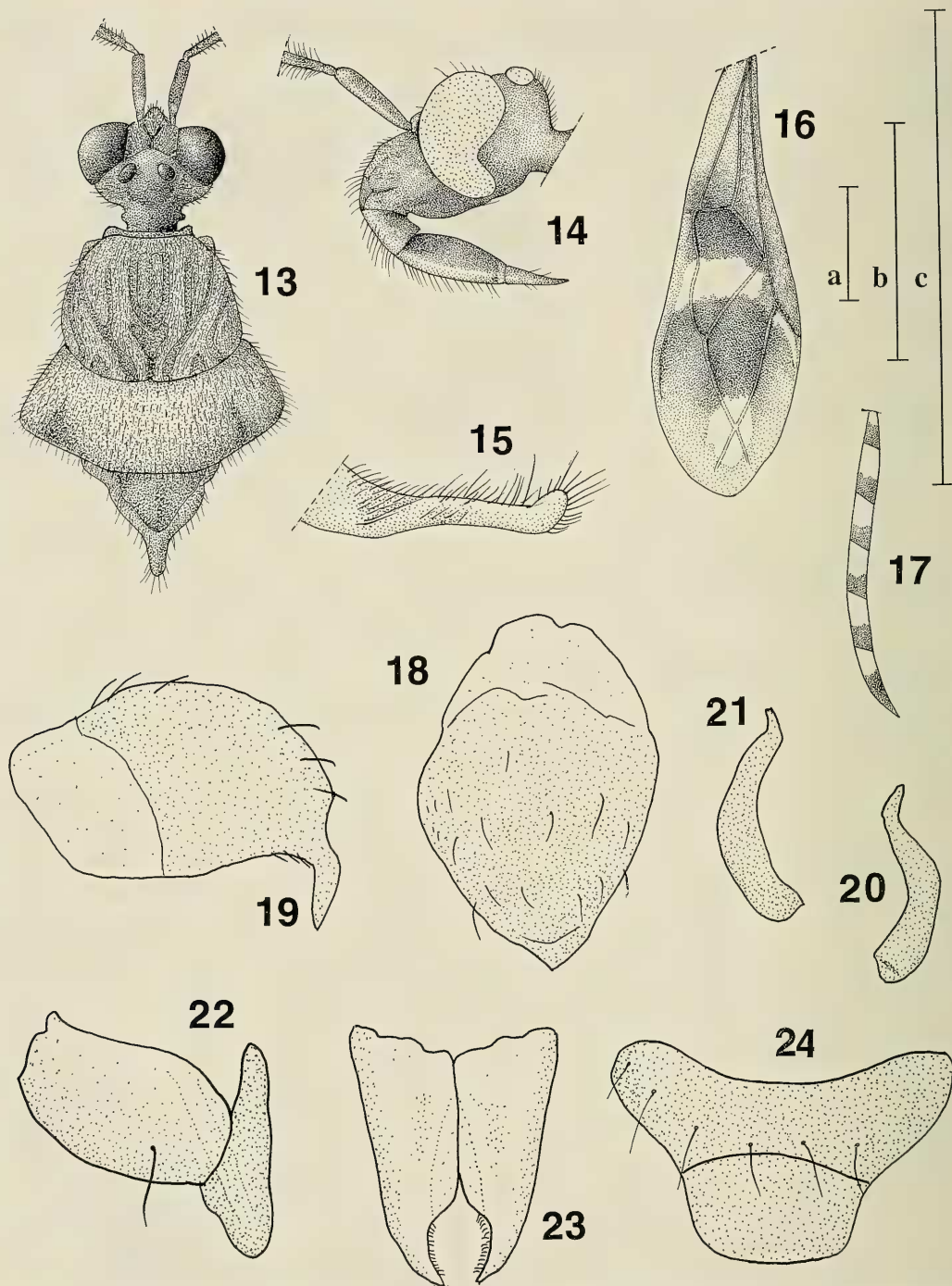
Male genitalia (Figs. 18–21). Medial process of pygophore, ventral and lateral view as seen in Figs. 18 and 19, respectively. Parameres (Figs. 20, 21), without hairs.

Female genitalia (Figs. 22–24). Gonocoxites VIII and gonapophysis, gonocoxite IX, and IX and X tergites as seen in Figs. 22, 23 and 24, respectively. IX and X tergites (Fig. 24), intersegmental line entire.

Measurements. See Table 1.

Distribution. Indomalayan and Palearctic. Bangladesh, Burma, China, Hong Kong, India, Japan, Java, Laos, Philippines, Sri Lanka and Sumatra (Fig. 25).

Material examined. Type ♀: Sud Java, Coll Breddin, *Pirates picturatus* sp. n., det. N. C. E. Miller 1939 (DEI). Type ♀: Sumatra, *Pirates patricius* sp. n., det. N. C. E. Miller 1939 (DEI). Type ♀: Philippines, Insulae Philippinae, Semper, *Spilodermus arcuatus* Stål (NRS); Allotype ♂: Philippines, Insulae Philippinae, Semper (NRS). Paratype ♀: Sumatra, *Pirates patricius* sp. paratype det. N. C. E. Miller 1939 (BMNH). BANGLADESH: Silhet, ♀ (NRS). BURMA: Teinzo, Fea Maggio, ♂ 1866 (ZIL). INDIA: Anamalai Hills Cinchona, 3500 ft, V-1969, P. S. Nathan, ♀ (ZMUA); New Delhi, 1-10-VIII-1958, Anekeandpoß, ♂ (ZIL); Dobhalwalla, 2304 ft, Dehra Dun, I., X-XI-1945, Jai K. Uniyal, ♀ (AMNH); Kashmir, ♂ (NRS). JAVA: Banjoewangi, Lucht, 1930, ♀, 2♂♂ (ZIL); Banjoewangi, Lucht, XII-1931-II-1932, ♀, 2♂♂ (ZIL); Banjoewangi, Lucht, without abdomen (ZIL); Tranquebar Urstermann, ♂ (NRS); Jjkarang Djampang, from M. E. Walsh, ♀, 2♂♂ XII-1938 (BPBM). LAOS: Sayaboury, Prov. Sayaboury, ♂ 31-XII-1965, native collector Bishop Museum (BPBM); Sayaboury, Prov. Sayaboury, ♀ 21-IV-1966, native collector Bishop Museum (BPBM). PHILIPPINES: Los Banos, Ids., ♀ VIII-1916, F. X. Williams col. (BPBM); Los Banos, P. I. Baker, without abdomen (AMNH); Mt. Makiling Luzon, Baker col., ♂



FIGS. 13-24. *Peirates quadrinotatus*. 13, Head, pronotum, and scutellum, dorsal view. 14, Head, lateral view. 15, Scutellum, lateral view. 16, Hemelytron. 17, Connexivum. 18, Pygophore, ventral view. 19, Pygophore, lateral view. 20, Left paramere, external view. 21, Right paramere, external view. 22, Gonocoxite and gonapophysis VIII. 23, Gonocoxites IX. 24, IX and X tergites. Scale lines = 2.0 mm: (a) for Figs. 17, 17; (b) for Figs. 13-15; and (c) for Figs. 18-24.

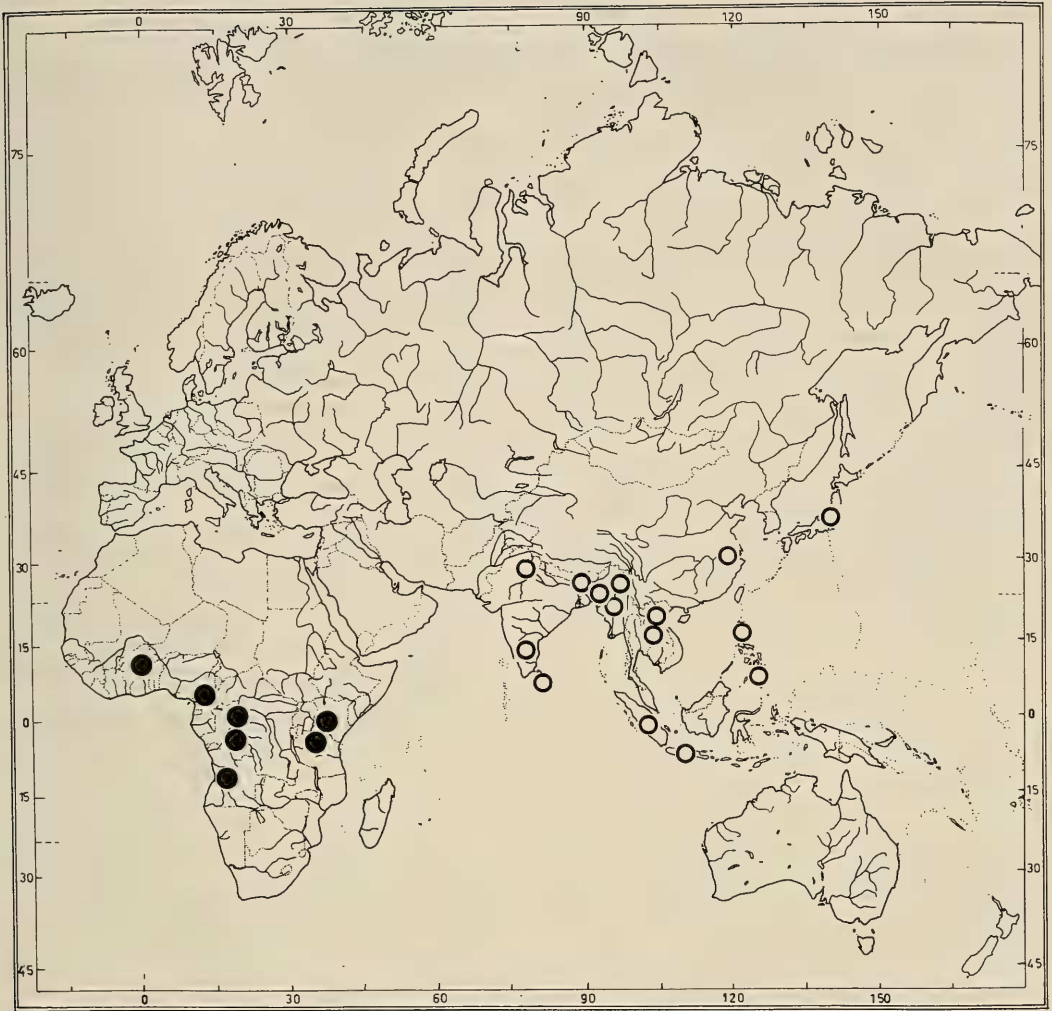


FIG. 25. Distribution of *Peirates argenteopilosus* (black circles) and *P. quadrinotatus* (open circles).

(AMNH); Mt. Makiling Luzon, Baker col., without abdomen (AMNH); Davan Mindanan Baker, without abdomen (AMNH); Mindanao, Mis. Or. Mt. Pomalihi 21 km W Gingoog City, 800–1000 m, 17-IX-1965, H. M. Torrevillas, col. Bishop Museum, ♀ (BPBM). SRI LANKA: (Lewis); Distant col. 1911: 383 (BMNH) *picturatus* BMNH, ♀, nymph (BMNH). WITHOUT COUNTRY: Carin As civii Ghecù, 1400–1500 m, L. Fea, ♂ III-IV-1988, 245 (ZIL).

Observations. *P. arcuatus* and *P. quadrinotatus* differ by the different color of the

anterior lobule of the pronotum only, so we consider them synonyms.

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LITERATURE CITED

- Blanchard, E. 1846. Voyage dans l'Amérique Méridionale par Alcide D'Orbigny. 1–222 pp.
- Coscarón, M. C. 1983. Revisión del género *Rasahus* (Insecta, Heteroptera, Reduviidae). *Revista del Museo de La Plata (Nueva Serie)* 13: 75–138.
- Coscarón, M. C. 1989. A phenetic study of the genus *Rasahus* Amyot and Serville (Heteroptera, Reduviidae). *Entomologica Fennica* 1: 131–144.
- Coscarón, M. C. 1994. The female terminalia in the genus *Rasahus* (Amyot and Serville) (Heteroptera, Reduviidae, Peiratinae). *Revista Brasileira de Entomologia* 38: 63–77.
- Coscarón, M. C. and Morrone J. J. 1995. Systematic, cladistic, and biogeography of the *Peirates colarti* and *P. lepturoides* species group (Heteroptera: Reduviidae: Peiratinae). *Entomologica Scandinavica* 26: 191–228.
- Dispons, P. 1969. Les Piratinae de L'Institut Royal des Sciences Naturelles de Belgique (Hemiptera-Heteroptera, Reduviidae). Première note. *Bulletin de l'Institut Royale des Sciences Naturelles de Belgique Entomologie* 45: 1–10.
- Distant, W. L. 1902. Rhynchotal notes. XV. Heteroptera: Family Reduviidae (Continued), Piratinae, and Ectrichodiinae. *Annals and Magazine of Natural History* (7)10: 282–285.
- Dohrn, F. A. 1860. Beiträge zu einer monographischen Bearbeitung der Familie der Emesina. *Linnaea Entomologiae* 14: 207–253.
- Fabricius, J. C. 1796. *Supplementum entomologiae systematicae*. Hafniae Proft et Storch: 511–546.
- Kiritshenko, A. N. 1961. Synonymical notes on Heteroptera. *Acta Entomologica Musei Nationalis Pragae* 34: 443–444.
- Lent, H. and Jurberg J. 1966. Revisão dos Piratinae Americanos. II. O gênero *Phorastes* Kirkaldy 1900, com um estudo sobre a genitália das espécies (Hemiptera, Reduviidae). *Revista Brasileira de Biologia* 26: 297–314.
- Lent, H. and Wygodzinsky P. 1979. Revision of the Triatominae (Hemiptera, Reduviidae) and their significance as vectors of Chagas's Disease. *Bulletin of the American Museum of Natural History* 163: 125–516.
- Maldonado Capriles, J. 1990. Systematic catalogue of the Reduviidae of the World. *Caribbean Journal of Sciences*, Mayaguez, 694 pp.
- Miller, N. C. E. 1948. New genera and species of Reduviidae from the Philippines, Celebes, and Malaysia. *Transaction of the Royal Entomological Society of London* 99: 411–473.
- Schouteden, H. 1931. *Catalogues raisonnés de la Faune entomologique du Congo Belge. Hémiptères- Réduviidés*. *Annales du Muséum du Congo Belge, Zoologie, Section II*, 1: 90–218.
- Serville, J. G. 1831. Description du genre *Peirates* de l'ordre des Hémiptères. *Annales des Sciences Naturelles (Paris)* 23: 213–222.
- Stål, C. 1868. Hemiptera Fabriciana. *Köngl Svenska Vetenskaps Akademiens Handlingar* 7: 1–148.
- Stål, C. 1870. *Enumeratio Hemipterorum*. *Köngl Svenska Vetenskaps Akademiens Handlingar* 9: 1–232.
- Stål, C. 1874. *Enumeratio Reduviidarum Europae, Africae, Asiae, et Australiae*. *Köngl Svenska Vetenskaps Akademiens Handlingar* 4: 3–97.
- Villiers, A. 1948. *Faune de l'Empire Français. IX. Hémiptères Réduviidés de l'Afrique Noire*. *Éditions du Muséum, Paris*, 489 pp.
- Villiers, A. 1963. *La Reserve Naturelle Integrale du Mont Nimba. XXV. Hemiptera, Reduviidae*. *Mémoires de l'Institut Française de l'Afrique Noire* 66: 479–565.
- Walker, F. 1873. *Catalogue of the specimens of Hemiptera Heteroptera in the collection of the British Museum. Part VII. Printed for the Trustees*, London 7: 1–123.